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EXAMINER	
WANG, TED M	
ART UNIT	**PAPER NUMBER**
2634	

DATE MAILED: 11/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/746,929	TEO ET AL.	
	Examiner	Art Unit	
	Ted M Wang	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *7/14/2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11,15 and 18-20* is/are pending in the application.

4a) Of the above claim(s) *12-14,16 and 17* is/are withdrawn from consideration.

5)☒ Claim(s) *1-6* is/are allowed.

6)☒ Claim(s) *15 and 18-20* is/are rejected.

7)☒ Claim(s) *7-11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Examiner's Statement

1. Applicants' arguments filed on 07/14/2004, with respect to Claims 1, 7, 15, and 18 have been fully considered and are persuasive. The rejection of Claims 1-11, 15, and 18-20 set forth in the previous office action, filed on 4/21/2004, has been withdrawn and because of the current amendment a new ground of rejection follows.

Claim Objections

2. Claim 7 is objected to because of the following informalities:

- On Claim 7 lines 16 and 18, insert "first" after "said" and "a", respectively.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lehman et al. (US 6,282,184) in view of Chien (US 6,512,478).

- With regard claim 15, Lehman et al. discloses a method for processing a superposed RF (radio frequency) signal containing two or more RF signals

occupying overlapping RF bandwidth (column 2 line 60 – column 4 line 16, Fig.2, and column 6 lines 33-47), in a wireless communication receiver comprising:

receiving said superposed RF signal (Fig.2 and 3 element 40);

converting said received superposed RF signal to a superposed digital signal using a previously determined common digitizing rate (Fig.2 and 3 element 106, and column 11 lines 11-49);

limiting said superposed digital signal to a bandwidth that corresponds with the bandwidth of said respective RF signals, providing a bandwidth clipped digital signal for each of said RF signals (Fig.2 elements 7-9, Fig.6 element 7, Fig.7 element 8, Fig.8 element 9); and

adjusting a sampling rate of the decoded digital signal to provide an output signal having a predetermined sampling rate (column 14 line 62 – column 15 line 39, and column 16 lines 22-55).

Lehman et al. discloses all of the subject matter as described above except for specifically teaching using multi-user detection responsive to synchronized data received from other RF signals to decode said bandwidth clipped digital signal to remove conventional and multi-access interference and provide a decoded digital signal.

However, Chien teaches that using multi-user detection responsive to synchronized data received from other RF signals to decode said bandwidth clipped digital signal to remove conventional and multi-access interference and

provide a decoded digital signal (Fig.9 element 1151, column 21 lines 36 – column 22 line 22, and column 24 line 60 – column 25 line 18).

It is desirable to use multi-user detection responsive to synchronized data received from other RF signals to decode said bandwidth clipped digital signal to remove conventional and multi-access interference and provide a decoded digital signal so that the system channel capacity is increased (column 22 lines 19-22) and the interference is also minimized (column 21 lines 28-35).

Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the method as taught by Chien in which, using multi-user detection responsive to synchronized data received from other RF signals to decode said bandwidth clipped digital signal to remove conventional and multi-access interference and provide a decoded digital signal, into Lehman's wireless communication receiver for processing a superposed RF signal containing two or more RF signals occupying overlapping RF bandwidth so as to improve the channel capacity and minimize the interference.

5. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lehman et al. (US 6,282,184) and Chien (US 6,512,478) as applied to claim 15 above, and further in view of Langberg et al. (US 5,852,630).

- With regard claim 18, Lehman et al. and Chien disclose all of the subject matter as described above except for the method written by a software program embodied in a computer-readable medium.

However, Langberg et al. teaches that the method and apparatus for a transceiver warm start activation procedure with precoding can be implemented in software stored in a computer-readable medium. The computer-readable medium is an electronic, magnetic, optical, or other physical device or means that can be contain or store a computer program for use by or in connection with a computer-related system or method (column 3, lines 51-65). One skilled in the art would have clearly recognized that the method of "Lehman et al. (US6,282,184) and Chien (US 6,512,478)" would have been implemented in a software. The implemented software would perform same function of the hardware for less expense, adaptability, and flexibility. Therefore, it would have been obvious to have used the software in "Lehman et al. (US 6,282,184) and Chien (US 6,512,478)" as taught by Langberg et al. in order to reduce cost and improve the adaptability and flexibility of the communication system.

6. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lehman et al. (US 6,282,184) and Chien (US 6,512,478) as applied to claim 15 above, and further in view of Wang et al. (US 5,838,267).

- With regard claim 19, Lehman et al. and Chien disclose all of the subject matter as described above except for specifically teaching a decoder that decodes said digital superposed RF signal to arrive at a first estimate of said RF signal and receives first estimate of other signals from other signal handling devices and, responsive thereto, provides a second estimate of said RF signal.

However, Wang et al. teaches a decoder that decodes said digital superposed RF signal to arrive at a first estimate of said RF signal (Fig.3 element 72, Abstract lines 1-25, column 2 lines 4-16, and column 5 lines 31-39) and receives first estimate of other signals from other signal handling devices (Fig.3 element 78 and column 2 lines 4-16, and column 5 lines 40-51) and, responsive thereto, provides a second estimate of said RF signal (Fig.3 elements 70 and 84 and column 2 lines 4-16, and column 5 lines 52-65).

It is desirable to have a decoder that decodes said digital superposed RF signal to arrive at a first estimate of said RF signal and receives first estimate of other signals from other signal handling devices and, responsive thereto, provides a second estimate of said RF signal so as to have the following advantages such as producing highly effective error control without increasing coding overhead and improving flexibility of the coding scheme (column 2 lines 17-25). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to replace the Lehman and Chiens' decoder with the decoder as taught by Wang et al. in which, using a decoder that decodes said digital superposed RF signal to arrive at a first estimate of said RF signal and receives first estimate of other signals from other signal handling devices and, responsive thereto, provides a second estimate of said RF signal, so as to further significant reduce in the residual bit error rate and frame erasure rate (column 2 lines 27-30).

- With regard claim 20, Lehman et al. further discloses that first digitizing rate is a multiple of a standard sampling rate for each RF signal of said digital superposed RF signal (column 9 line 46 – column 10 line 7 and column 10 lines 38-52) and said signal handling device further comprises a stream separator that forms a number of streams from said digital superposed RF signal, each stream comprising a set of samples taken at said standard sampling rate for said RF signal (column 11 lines 15-31, where examiner considers the serial-to-parallel converter as a stream separator). All other limitation is contained in claim 19. The explanation of all the limitation is already addressed in the above paragraph.

Allowable Subject Matter

7. Claims 8-11 are objected to as being dependent upon an objected claim, but would be allowable if rewritten to overcome the objection(s) set forth in this Office action.

8. Claims 1-6 are allowed.

9. The following is an examiner's statement of reasons for allowance.

- The prior art fails to teach a receiver of claim 1 that specifically comprises the following:

  -- The instant application is deemed to be directed to a non-obvious improvement over the invention patented in Pat. No. US 6,282,184 and US 6,512,478 and *Ming* et al. (An efficient IF architecture for dual-mode GSM/W-CDMA receiver of a software radio, Mobile Multimedia Communications, 1999, (MoMuC '99) 1999 IEEE International Workshop

on, 15-17 Nov. 1999). The improvement comprises "a multi-user detection decoder that shares data with multi-user detection decoders in other ones of said signal handling device to decode said bandwidth clipped digital signal to remove conventional and multi-access interference and provide a decoded digital signal" as recited so as to get the following benefits - more efficient utilization of the spectrum, improved switching times (seamless handover) between the two or more wireless services (e.g. between voice and data services), and simultaneous voice and data services through a single radio receiver (page 2 lines 16-20).

Conclusion

10. Reference US 5,608,722, US 5,936,950, and US 6,618,433 are cited because they are put pertinent to the Wireless communication with multi-user detection. However, none of references teach detailed connection as recited in claim.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ted M Wang whose telephone number is (571) 272-3053. The examiner can normally be reached on 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571) 272-3056. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.

Ted M Wang
Examiner
Art Unit 2634

Ted M. Wang

SHUWANG LIU
PRIMARY EXAMINER